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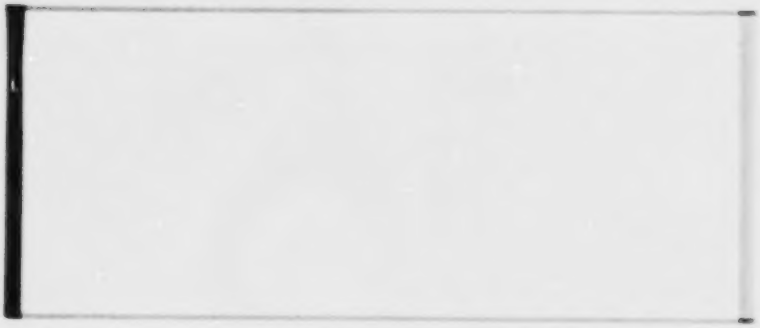

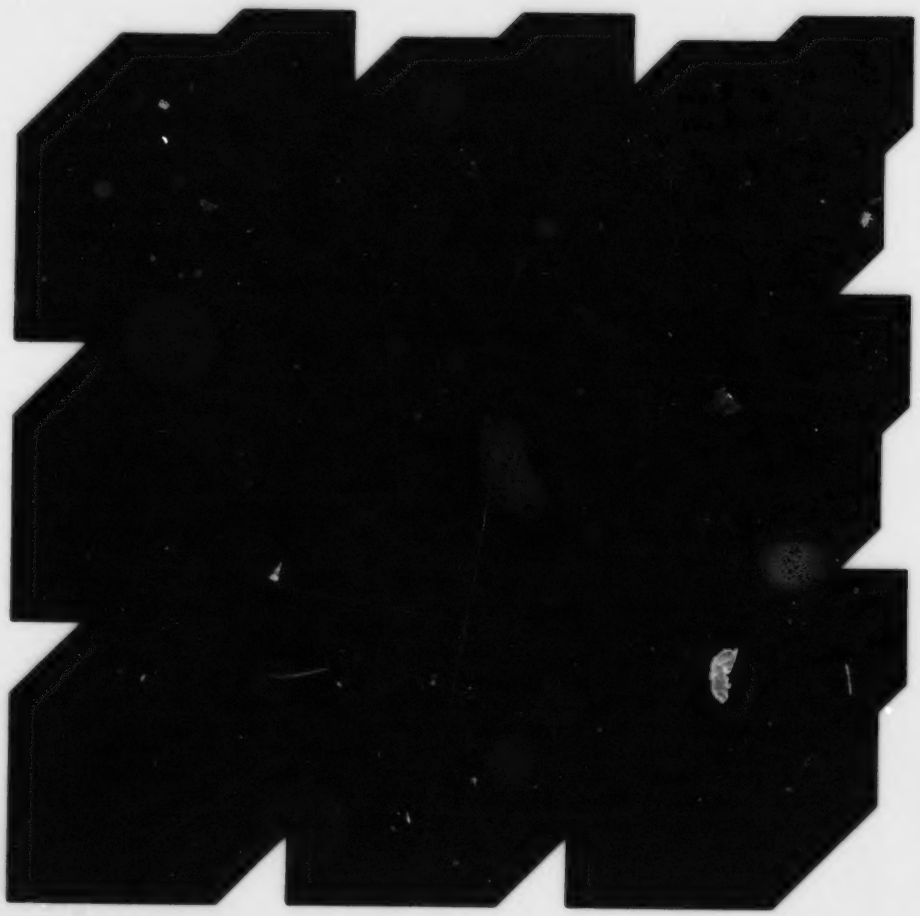

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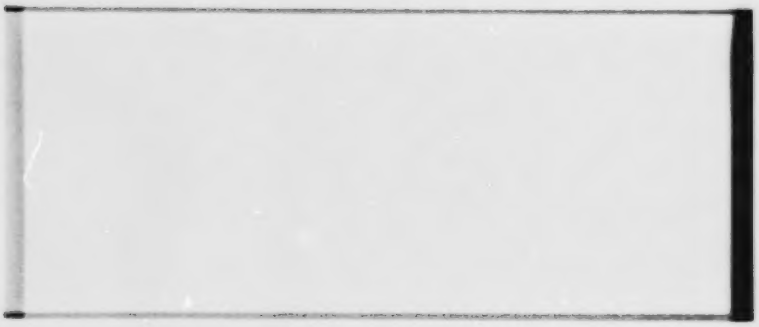

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DISCUSSION PAPER NO. 297

Mergers and Merger Policy in the Canadian Manufacturing Sector: 1971-79

by John R. Baldwin and
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RÉSUMÉ

Le Canada a tenté sans succès, depuis que le Conseil économique du Canada a publié son Rapport provisoire sur la politique de concurrence, en 1969, de modifier les dispositions de sa Loi relative aux enquêtes sur les coalitions, en rapport avec les fusions. Malgré que l'on convienne, de façon générale, que les dispositions actuelles sur les fusions sont inopérantes, la question se pose toujours de savoir si les avantages d'une législation s'interposant possiblement sur le marché pour les cas de mainmise justifient les coûts à engager. D'une part, ceux qui favorisent une législation plus vigoureuse insistent sur le taux élevé de concentration dans l'industrie canadienne, surtout en comparaison avec les États-Unis, et suggèrent que les avantages d'une législation canadienne en matière de fusion seraient encore plus grands qu'aux États-Unis. D'autre part, ceux qui sont en faveur de politiques moins exigeantes font valoir que même si les fusions n'ont donné lieu qu'à fort peu d'avantages tangibles, elles n'ont que peu d'effet sur la concentration et ne devraient donc pas faire l'objet d'un tamisage destiné à contrer le développement d'une nouvelle puissance sur le marché. Les problèmes que soulève la formulation d'une législation satisfaisante sur les fusions provient, pour une large part, du manque d'analyse des effets des fusions au Canada.

Pour rectifier cette situation, nous utilisons une base de données beaucoup plus détaillée que par le passé, établie par Statistique Canada sur les fusions dans le secteur de la fabrication durant la période 1970-1979. La base est établie à partir de la structure de propriété de chaque entreprise, dans chacune des industries de fabrication à un niveau de désagrégation à quatre chiffres au cours de la période. Elle nous permet de regrouper toutes les entreprises en co-participation soit à l'intérieur de l'industrie à quatre chiffres (c'est-à-dire les entreprises non consolidées) ou à l'intérieur même du secteur de la fabrication (c'est-à-dire les entreprises consolidées). Cette méthode nous permet un examen beaucoup plus complet que par le passé de la procédure de fusion.

À l'aide de cette base de données, nous tenterons de voir jusqu'à quel point l'intervention dans le jeu du marché en vue de la mainmise des sociétés entraîne des coûts substantiels. Ces coûts ne peuvent être évalués que par une appréciation plus poussée de la nature du processus de fusion. Si ce processus fait partie intégrante du processus naturel par lequel les ressources sont redistribuées au sein de l'économie, les coûts potentiels d'une législation devant restreindre cette redistribution deviennent importants. Nous tâchons donc de voir s'il existe des différences entre la procédure d'accès par la fusion (c'est-à-dire la diversification) et la création d'une nouvelle usine, ou entre le processus interne d'expansion des entreprises

faisant déjà partie d'une industrie en recourant à la fusion (soit l'expansion horizontale), et la création d'une nouvelle usine. Nous nous demandons ensuite si ces différences soulèvent des problèmes particuliers devant être traités par voie de législation.

Notre analyse nous a permis de tirer un certain nombre de conclusions. Tout d'abord, la fusion ne constitue pas une procédure anormale et ne change pas de façon substantielle la structure du secteur de la fabrication.

Les fusions horizontales ont diminué en importance. Leur répartition parmi les entreprises canadiennes et les entreprises étrangères démontre l'importance de ces deux segments de la fabrication et permet donc de conclure à une certaine parenté d'objectifs. Bien que les plus petites entreprises sont plus susceptibles d'être acquises par les plus grandes, il existe suffisamment d'activité de fusion à l'intérieur des mêmes catégories pour laisser croire que la fusion renforce la capacité concurrentielle des petites entreprises. En outre, l'accès par fusion ainsi que l'expansion par fusion résultent du jeu des mêmes forces que la création de nouvelles usines. Deuxièmement, lorsque le jeu des forces est différent pour la fusion et la création d'une usine, ces différences n'ont rien de quoi inquiéter. Le contraire est plutôt vrai. Le fait que l'accès par fusion soit en rapport direct avec l'existence de barrières à

à l'entrée montre que la fusion joue un rôle positif, car elle permet de nouvelles entrées dans des secteurs qui ont toujours été considérés comme ne présentant que peu de concurrence. Le fait que les fusions horizontales sont associées à la rationalisation montre que les gains d'efficacité obtenus par la fusion peuvent être importants.

La publication, dans ce document, des résultats de notre recherche n'a pour but que de contribuer au débat. Nos conclusions n'ont certainement aucun caractère définitif, mais nous continuons à ressentir le grand besoin d'études du genre de celles recommandées par le Rapport de Skeoch-Macdonald de 1976. Nous pensons néanmoins que ce document permettra de prendre un meilleur aperçu du processus de fusion et de mieux le comprendre. Il ne contribue pas exclusivement à renforcer les arguments favorables ou défavorables à une législation plus sévère en matière de fusion. À nos yeux, le phénomène des fusions paraît correspondre à des signes de santé d'une économie. Ainsi, un vaste jeu de restrictions ne nous paraît pas approprié. Il ne faut pas en conclure toutefois que les fusions n'entraînent pas de conséquences au plan de la concurrence. Les données sur la répartition des entreprises engagées dans le processus de fusion montrent que les entreprises, qu'elles soient grandes ou petites, peuvent en retirer des avantages au plan de leur expansion. Nous sommes d'avis que les

résultats obtenus par notre recherche montrent que toute politique en matière de fusion devrait être élaborée avec une extrême prudence.

ABSTRACT

Canada has been attempting, unsuccessfully, to change the merger provisions of the Combines Investigation Act since the Economic Council of Canada published its Interim Report on Competition Policy in 1969. Even though there is substantial agreement that the present merger provisions are ineffective, the issue that remains unresolved is whether the benefits of merger legislation that potentially interferes with the market for corporate control outweigh the costs. On the one hand, those that argue for stronger legislation cite the high concentration in Canadian industry, particularly with reference to the U.S., and imply that the benefits of merger legislation in Canada are even greater than for the United States. On the other hand, those that argue for a less stringent policy argue that although mergers may have yielded few discernable benefits, they have little effect on concentration and should not therefore be subject to a pre-screening test that worries about the development of incipient market power. The problems involved in devising an appropriate merger legislation stem, in large part, from the lack of analysis devoted to the effect of mergers in Canada.

In order to rectify these problems, we make use of a much more detailed data base created by Statistics Canada on mergers in the manufacturing sector during the period 1970-79. This base follows the ownership of each

establishment in each four-digit manufacturing industry during this period. It allows us to group all commonly-owned establishments within either a four-digit industry (i.e., the unconsolidated enterprise) or within the manufacturing sector (i.e., the consolidated enterprise). This permits a much more comprehensive examination of the merger process than previously.

Using this data base, we attempt to shed light on the extent to which there are substantial costs of interfering with the market for corporate control. These costs can be understood only by having a better appreciation of the nature of the merger process. If the merger process is part of the natural process by which resources are reallocated in the economy, then the potential costs from merger legislation that restricts such reallocation become large. We therefore examine whether there are any differences between the entry process when accomplished by merger (i.e., diversification) as opposed to new plant creation or between the internal expansion process of firms with activities already in an industry when accomplished by merger (i.e., horizontal) as opposed to new plant creation. We then ask whether any such differences suggest particular problems that need to be dealt with by legislation.

We draw several conclusions from our analysis. First, the merger process is not an aberrant one that is dramatically changing the structure of the manufacturing sector.

Horizontal mergers have decreased in importance. Their distribution across the domestic and foreign-owned segment reflects the importance of these two segments within manufacturing and thus suggests a certain commonality of purpose. While smaller firms are more likely to be acquired by larger ones, there is sufficient intra-class merger activity to suggest it strengthens small firms' ability to compete. In addition, both entry by merger and expansion by merger respond to much the same forces as new plant creation. Second, where there are differences between the merger and the plant creation process, they are not such as to cause consternation. Indeed the opposite is the case. That entry by merger is positively correlated with entry barriers suggests it performs a valuable function of permitting new entrants where the traditional literature has claimed competition may not be intense. That horizontal mergers are associated with rationalization suggests efficiency gains from these mergers may be important.

The evidence presented in this paper is meant to help the debate. Rut it is certainly not definitive. We still desperately require the sort of studies recommended in the 1975 Skeoch-Macdonald Report. Nevertheless, we believe this paper does permit one to obtain a better picture and understanding of the merger process. It does not exclusively support the arguments of those who would want merger

legislation to be more or less stringent. Mergers appear to be part of an ongoing process symptomatic of a healthy economy. Hence a broad based net is probably inappropriate. Nevertheless, this does not mean mergers have no competitive consequences. The data on size distribution of firms engaged in the merger process not only show that some small firms have gained in size but so also have large firms. We suggest that the evidence presented here emphasizes the need to be extremely selective in devising a merger policy.

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I Introduction

In contrast to the United States, Canada does not possess merger legislation that attempts to stop the development of market power in its incipiency. While Canadian antitrust law prohibits mergers that operate to the detriment of the public[1], no contested merger case has ever been successfully prosecuted (see Borgsdorf, 1973, McFetridge, 1974, Reschenthaler and Stanbury, 1977a, 1977b, Green, 1980). This is because the courts have refused to draw inferences about the likelihood of market power being exploited. They have insisted on evidence of there being no competition (a virtual monopoly is required) or of monopolistic actions of a detrimental nature that flow directly from the merger (i.e., exclusionary practices aimed at restricting entry).

Many Canadian economists have decried this state of affairs. Stanbury and Waverman (1979, p. 129) note disapprovingly that Canadian merger law can probably do nothing but "prevent all but the merger of the last two or three firms in an industry". Caves (1979, p. 519) claims the failure of Canadian law in this area is "widely conceded". Reuber and Wilson (1979, p. 267) refer to Canadian merger law as inadequate. Green (1980, p. 180) describes merger legislation as "the most unsatisfactory facet of Canadian competition law". Borgsdorf (1973) refers to it as a "virtually unconstrained legal environment".

While there has been general but by no means unanimous agreement in the academic community that the Canadian Combines Investigation Act is ineffective when it comes to its merger

provisions, the requisite modifications are not generally agreed upon - even in the federal government's own background studies. A report issued by the Economic Council of Canada (1969) and one that was done for the federal Department of Consumer and Corporate Affairs (Skeoch and McDonald, 1976) argued for more stringent legislation. The Royal Commission on Corporate Concentration (RCCC, 1978) took a much more cautious stance. Noting that the number of mergers was not large and that mergers were probably beneficial in that they served to exploit scale economies, the RCCC argued that the danger from corporate mergers was 'slight' (p. 160) and that the law should not try to deal with incipient market power but should concentrate upon proven abuses stemming from observed conduct (what has essentially been the historical approach). Perhaps as a result of this lack of consensus, several bills (C-256, 1971; C-42, 1977; C-13, 1977; Bill C-29, 1984 - see Rowley and Stanbury, 1978 and Erola, 1984) have been introduced into parliament proposing changes in the merger provisions of the Combines Investigation Act: none of the latter have been passed.

The issue that remains unresolved is whether the benefits of merger legislation that potentially interferes with the market for corporate control outweigh the costs. Those who argue for new merger legislation make reference to the higher levels of concentration in Canadian compared to American markets (Stanbury and Waverman, 1979, p. 122) and thus, by inference, imply that the benefits of merger legislation in Canada are even greater than for the United States. But the extent to which Canadian concentration is greater than American has in the past been overstated. Elsewhere (Baldwin, Gorecki and McVey, 1985), we have recalculated the Canadian concentration

indices taking into account imports and have found concentration decreases markedly when this is done. For example, the average four firm concentration ratio falls fom 52.6 per cent to 42.7 per cent in 1979 across 140 4-digit manufacturing industries when imports are properly incorporated. As such, it is likely that the benefits of incipient market power legislation that focuses on mergers has been overstated previously.

If there are to be positive benefits from merger legislation, the net cannot be cast too broadly or a substantial number of harmless transactions will be affected. The number of transactions that bear careful scrutiny is probably quite small. The Economic Council of Canada (1969, p. 86) concluded, after a case study of 997 acquisitions, that about 17 per cent might have qualified for review if domestic concentration alone was a concern; and only 8 per cent if a number of other criteria in addition to concentration were included. However, as noted above, if imports are properly considered, concentration levels drop and this implies that even the percentages suggested by the Economic Council are high.

Of course, the costs of merger legislation can be reduced by using criteria that allow all but the most damaging cases to escape review; but the criteria that should be used have not been clearly established. Canadian empirical studies linking structure to performance have not all found a significant relationship between concentration and profitability across the entire manufacturing sector (see Jones et al., [1977] for a U.S./Canada comparison). While Jones et al. find a significant relationship in a subset of industries (producer industries), the critical level of concentration beyond

which concentration very much matters has not been clearly established. Thus the use of concentration statistics per se does not promise to be a very precise criterion for establishing which mergers may have a detrimental effect on competition. Other measures such as size of participants have even less merit.

While the case of those who would argue for more stringent merger legislation is weak, the same can be said of the opposite point of view. The RCCC (1978, p. 158-160) argued that although mergers may have yielded few discernible benefits, they have little affect on concentration and should not therefore be subjected to a pre-screening process that worries about the development of incipient market power. The Royal Commission was concerned that potential firm economies of scale would be lost if mergers were discouraged as a result of new legislation. Unfortunately, the RCCC's examination of the extent to which scale economies exist is less than persuasive. Its chapter on economies of scale selectively chooses that evidence which suggests some benefits will accrue from increased concentration and ignores evidence which conflicts with the Commission's preconceived notions of the existence of substantial unexploited economies at the firm level (Baldwin, 1985). In the case of the existence of firm level economies, the Commission's conclusions contrast starkly with the evidence of the only research study commissioned by it in this area (McFetridge and Weatherby, 1977). One reviewer of the Commission's argument in this area charitably characterized it as lacking "depth and balance" (Daly, 1979, p. 96).

The problems involved in devising appropriate merger legislation stem from the lack of analysis devoted to the effect of

mergers in Canada, a point noted by Skeoch and MacDonald (1976, pp. 48-49). The intellectual effort that has gone into the discussion of revisions to Canadian merger legislation has been hampered by a paucity of data on the merger process. The data used by the Royal Commission (1978) were based on an incomplete sample taken from published sources, principally financial newspapers.[2] Stanbury and Waverman (1979) have questioned the usefulness of the Commission's data because of their incompleteness. This criticism is not without merit, as the Commission acknowledges (p. 140). The RCCC (1978, Table 6.1, p. 141) reports that mergers, as a percentage of active domestic companies, were .20, .17, .18, .14, and .10 for each of the years from 1970 to 1974 respectively. This averages out to .16 per cent a year, or less than 1 per cent for a six-year period. However, Statistics Canada (1981a) provides more comprehensive data on mergers during the period 1971-76 in the mining and manufacturing sectors. Of the 26,000 plants studied, 1,336 or 5.1 per cent were taken over (Statistics Canada (1981a), pp. 10-11). Of course, using numbers of acquired establishments may understate the importance of mergers if the acquired firm is larger than the average. The Statistics Canada study indicates that on the basis of value of sales, acquisitions are even more important. Those establishments that were acquired between 1971 and 1976, as of 1976, accounted for 8.7 per cent of total value of production. These data suggest mergers are a far more important phenomenon than might be inferred from the Royal Commission's data.

This is not the only problem with the Royal Commission's evidence on mergers. The cross-sectional merger data provided by Globerman (1977) in a background study covers only 17 two-digit

Canadian manufacturing industries for two sample periods -- 1945 to 1953 and 1953 to 1961. As Stanbury and Waverman (1979, p. 116) point out, these data are dated and highly aggregated. Secondly, the data refer only to the number of acquired firms in total. Horizontal as opposed to diversified mergers are not distinguished in this data base.

In order to rectify these problems, we make use of a much more detailed data base created by Statistics Canada on mergers in the manufacturing sector during the period 1970-79. This base follows the ownership of each establishment in each four-digit manufacturing industry during this period. It allows us to group all commonly-owned establishments within a four-digit industry into a unit which we call the unconsolidated enterprise, and all unconsolidated enterprises in the manufacturing sector under common control into a unit which we refer to as the consolidated enterprise or firm. This permits a much more comprehensive examination of the merger process than previously.

Using this data base, we attempt to shed light on the extent to which there are substantial costs of interfering with the market for corporate control. These costs can be understood only by having a better appreciation of the nature of the merger process. If the merger process is part of the natural process by which resources are reallocated in the economy, then the potential costs from merger legislation that restricts such reallocation become large. We therefore examine whether there are any differences between the entry process when accomplished by merger (diversification) as opposed to new plant creation or between the internal expansion process when accomplished by merger (horizontal) as opposed to new plant creation.

We then ask whether any such differences suggest particular problems that need to be dealt with by legislation.

In the first section, we provide general descriptive statistics that allow a better understanding of the merger process. We examine the extent to which horizontal mergers are the dominant form of merger activity. We ask whether domestic or foreign firms account for an 'undue' proportion of merger activity. We examine the relative size distribution of acquired versus acquiring firms. In the subsequent section we evaluate the extent to which diversified mergers are an important form of entry and the importance of horizontal mergers as a method of expansion. We also examine the characteristics of acquired establishments in each category. Finally, we use regression analysis to examine the industry characteristics that are related to merger intensity.

II An Overview

a) The Importance of Horizontal Mergers

The traditional anti-trust interest in mergers stems from the possibility that they may enhance monopoly power. This is more likely to occur in the case of horizontal mergers. The evidence, however, suggests that in Canada horizontal mergers are not the dominant form of merger activity and that their importance has been declining over time.

A merger takes place when one consolidated firm acquires another. But the acquired firm may possess unconsolidated enterprises in different industries, and the merger may be both horizontal and diversified at the same time. In order to avoid having to classify in

arbitrary fashion such an acquisition as being primarily horizontal or primarily diversified, we define the acquired unit in a merger as the unconsolidated enterprise. A horizontal merger is defined to occur when the acquiring firm possessed an unconsolidated enterprise in the same 2-digit industry as the unconsolidated enterprise being acquired.

In Table I, we report the relative importance of horizontal mergers for the period 1971-1979.[3] The importance of merger activity in a particular category is measured as the ratio of the number of acquired firms (unconsolidated enterprises) in that category (i.e., horizontal or vertical and conglomerate) relative to the total number of acquired firms.[4] It is apparent that horizontal mergers have been declining in importance over the seventies. In the period 1971-73, horizontal mergers accounted for 61 per cent of all mergers; in 1974-77, only 47 per cent; and in 1977-79, only 39 per cent.

Even these percentages probably overstate the extent to which mergers have the possibility of enhancing market power. Horizontal mergers between enterprises within the same 2-digit industry but not in the same 3-digit industry, or within the same 3-digit industry but not in the same 4-digit industry are often between firms with products that have little complementarity. Vegetable Oil Mills and Poultry Processors fall within the same 2-digit industry, Food and Beverages, but a different 3-digit industry classification and the cross-elasticity of demand is probably not so high as to create much market power from a horizontal merger between these two categories. If we only define potentially damaging horizontal mergers as those within 4-digit industries (the highest level of disaggregation in the data base), then the percentage of horizontal mergers has fallen from

some 43 per cent in 1971-73 to only about 30 per cent in 1977-79.

b) The Division of Merger Activity Between the Domestic and Foreign Sector

Merger activity may also be regarded as anti-competitive if it is concentrated in that segment of the industrial population that is particularly adept at exploiting its relative strength. For some time, the foreign-owned sector has been regarded in Canada with disapprobation. Several government sponsored studies -- the Gordon Commission (Canada, 1958), the Watkin's Report (Canada, 1968) and the Gray Report (Canada, 1972) all questioned the benefits of foreign investment. The Royal Commission on Corporate Concentration (1978) argued that restrictive trade practices of the foreign sector were particularly worrisome. (Report, p. 195.) The work of certain economists has contributed to publically-expressed concerns in this area. English (1964) and Rosenbluth (1970) pointed out the connection between the presence of foreign firms and concentration. The malaise with foreign investment can also be traced to the observation that foreign firms tend to be larger than Canadian firms (Statistics Canada [1978]), that they import much of their sales from related companies located abroad (Department of Regional Economic Expansion, 1984), and that foreign firms possess a productivity advantage over their Canadian counterparts (Globerman, 1979).

In order to examine whether merger activity is particularly concentrated in the domestic as opposed to the foreign sector, we compare the importance of domestic and foreign merger activity by examining the relative importance of enterprises acquired by each in

the merger process. Table 2 summarizes the relative importance using the percentage of all acquired firms, their shipment values and their employment as of 1979. It is evident that Canadian firms dominated merger activity. The total employment of firms acquired by Canadian firms accounted for 60.5 per cent of the employment of all acquired firms between 1971 and 1979. But Canadian firms accounted for 58.9 per cent of all employment in the manufacturing sector as of 1976. (Statistics Canada, 1981b, p. 11). Therefore we conclude that the merger process was not particularly biased in favour of the foreign sector.

We also examine whether there was any trend in the relative importance of domestic versus foreign merger activity over this period. The enactment of certain provisions of the Foreign Investment Review Act (FIRA) in April 1974 provided a vehicle by which take-overs by foreign firms of Canadian firms could be more carefully scrutinized and this may have had an inhibiting effect on this sector.[5] Table 3 examines the trend using the relative distribution of numbers of acquisitions of unconsolidated enterprises; Table 4 uses the distribution of total employment of acquired firms.

Table 3 indicates that foreign acquiring firms increased their activity relative to domestic acquiring firms after 1974 (panel B) but foreign acquired firms were reduced in importance (panel C). This was primarily the result of foreign acquiring firms switching their acquisitions from foreign-owned firms operating in Canada to domestically-owned firms (panel A). Table 4 confirms that the same trend occurred when the relative importance of acquired firms is measured in terms of employment. Of interest is the fact that over

the entire post FIRA period from 1974-79, the percentage of employment in firms acquired by Canadian firms was 60.3 per cent as opposed to 60.7 per cent in the pre-FIRA period (panel B, columns IV and I respectively). Therefore we find no evidence that FIRA impacted upon the relative importance domestic as opposed to foreign firms. FIRA appears to have just shifted the acquisition activity of foreign firms from the foreign to the domestic sector -- with the decline in the former just balancing the increase in the latter.

c) Mergers and Size

Mergers have been viewed with concern by those who regard them as inevitably leading to the development of market power. The extent to which this is possible depends not only on the relative importance of horizontal mergers but also on the degree to which mergers are concentrated in large as opposed to small size classes.

In Table 5, we present the size distribution of all acquired consolidated enterprises by employment (wage and salary earner) size classes. Each size class's percentage of the total number, the total sales and the total employment of acquired firms as of 1979 are presented in columns I, II and III respectively. We also include the average size of each acquired consolidated enterprise (column IV), the average size of each establishment per acquired consolidated enterprise (column V) and the number of establishments per acquired consolidated enterprise (column VI) by size class of the acquired enterprise.

The data in Table 5 show that most acquired firms are small. However the small number of acquired firms in the largest employment

categories (200+) account for a greater percentage of all employees in acquired firms than their respective percentage of the number of acquisitions. The largest acquired firms also have the most establishments.

Data on the size of acquisitions alone hide considerable detail about the underlying transfer process. If large firms are purchased by smaller firms, the merger process might be inferred to have a different effect on performance than if large firms generally just purchased large firms. It is therefore of interest to know whether firms engaged in the merger process tend generally to purchase firms of similar size. Similarly data on the eventual destination of an acquired firm will reveal which size class is gaining at the expense of others. Table 6 presents, for each employment size class of acquiring firms (the consolidated enterprise), the percentage distribution of acquired firms (also consolidated enterprises) by size class. Table 7 presents, for each employment size class of acquired firms (the consolidated enterprise), the percentage distribution of acquiring firms (also the consolidated enterprise) by size class. In each case, the percentage distribution was calculated using total employment; in Table 6, of all units acquired by a firm in a particular size class, and in Table 7, of all acquired firms in a particular size class.

Table 6 reveals that in general acquiring firms concentrate their activity in the same size class. Except for size classes II, V and VI, the percentage listed in the diagonal element is larger than any other column entry. Thus small firms generally purchase small firms; and large firms acquire large firms. There is therefore considerable

immobility or inertia in the system. The acquisitions data suggest that small firms do tend to grow via the merger process but they would jump only about one relative size class by doing so. On the other hand, the largest firms are not just ingesting small firms. It should, however, be noted that the acquisition distributions are generally skewed downwards. The intermediate size classes have a substantial proportion of their purchases in the size classes that are immediately below their own.

Table 7 reveals a similar pattern with regards to the size class of the acquiring firm. In general, when a firm is sold, it is acquired by a firm in the same size class. The diagonal elements are generally larger than off-diagonal elements. However, the sales distributions are almost always skewed upwards. Firms in a given size class are more likely to be purchased by firms in a larger than a smaller size class. More importantly, the smaller size classes are less likely to purchase a larger firm than are larger firms likely to purchase a smaller firm -- as a comparison of the reverse diagonal elements indicates. Finally, columns VII and VIII indicate that the largest two categories buy a substantial proportion not only of their own category but also of all smaller categories.

The distribution of total employment for all mergers for both acquiring and acquired firms from Tables 6 and 7 is summarized in Table 8. Row A presents the ratio of employment for firms that are acquired in a particular size class to the employment of all acquired firms; Row B, the ratio of employment of acquisitions made by firms in the same size class to the employment of all acquired firms. Thus acquired firms in the size class 0-100 employees accounted for 12 per

cent of all acquired firms; but acquiring firms in this size class acquired only 4.9 per cent of employees of all acquired firms. If the percentage of employment in Row A is larger than in Row B, the size class is diminishing in importance as a result of the merger process. From Table 8, it is apparent that the smallest three size classes are losers; the largest two are the winners. The intermediate ranges (from 500 to 2500 employees) remain on balance relatively unaffected.

d) Multiple Mergers

If acquiring firms generally make multiple acquisitions, then there is greater need to worry about the extent to which the merger process permits firms to extend their grip on the manufacturing sector. In Table 9, we indicate the extent to which the acquiring firm (defined as the consolidated firm) acquires more than one consolidated firm, more than one unconsolidated enterprise, and more than one establishment. We also present a measure of the importance of each multiple acquisition category by giving the percentage of total employment of all acquired entities accounted for by the acquired entities (the consolidated, unconsolidated and establishment) in that category. Thus Table 9 shows that 907 of the 1218 acquiring firms acquired only 1 consolidated enterprise and the employment as of 1979 of acquired consolidated enterprises that fell in that category made up 31 per cent of employment in all acquired firms as of 1979.

It is apparent that there was a relatively small number of multiple acquisitions of consolidated enterprises. Over 95 per cent of acquiring firms made four or less multiple acquisitions of consolidated enterprises. These acquired firms accounted for almost 80

per cent of all employment in acquired firms. Thus multiple acquisitions of consolidated enterprises (defined as more than 4) are not very significant.

When we examine the distribution of acquisitions of unconsolidated enterprises or establishments, the same conclusion emerges -- though it is less pronounced since the average acquired consolidated enterprise consists of more than one unconsolidated enterprise and several establishments. Nevertheless, the largest acquisition category for both unconsolidated enterprises and establishments (15+) has a relatively large proportion of employment. Together with the data reported in columns II and III on multiple acquisitions of consolidated enterprises, this suggests that some of the largest gains in size come not from the multiple acquisition of consolidated enterprises but from the acquisition of a consolidated enterprise that consists of several unconsolidated enterprises or a large number of establishments.

e) Conclusion

The data suggest that the importance of the type of merger that is most closely associated with abuses of market power has become much less important. Moreover, domestic and foreign merger activity account for about the same proportion of merger activity as they do of general economic activity. While there is some indication that the merger process reallocates resources from smaller to larger firms, there is a remarkably large percentage of transfers within the same size class. This would strengthen the ability of firms initially in each of these classes to compete with those in the largest and

therefore the net effects on competition cannot a priori be said to be detrimental -- at least on the basis of this aggregate data. Finally, there is little indication that multiple acquisitions by acquiring firms of other firms are being used to generate a dramatic increase in market strength.

III The Role of Mergers in the Entry and Expansion Process

In order to shed further light on the importance of the merger process, more disaggregated data is required. In particular, the failure to separate horizontal mergers from diversified mergers in the aggregate data previously presented may conceal important differences between the two. Equally important, the importance of mergers must be evaluated as part of a complex process that realigns production units over time. While some firms already in an industry may merge in order to expand, others may do so by building new plants. While some firms not in an industry may merge with existing firms so as to enter the industry, other entrants may enter by building new plant. Mergers then can be viewed as a natural part of the expansion process. Firms that enter by way of acquiring a plant and then use it to expand can provide a dynamic influence that may stimulate competition. Diversification by way of merger is an alternative to entry by way of plant creation. Horizontal mergers are an alternative to expansion by existing firms via plant creation.

The importance of the merger process relative to these alternatives in Canada was gauged by following the ownership of all plants between 1970 and 1979. Over this period, each plant in the manufacturing sector was identified as being new to an industry (a

birth), as exiting (a death), as acquired or divested.[6] Similarly unconsolidated enterprises, consisting of commonly-controlled establishments at the 4 digit SIC,[7] were classified as new, exiting, or continuing firms. This allowed identification of the means by which entry or expansion of the unconsolidated firm in each 4-digit manufacturing industry took place.

The acronyms and the corresponding categories used to analyze the entry, exit and merger process were:

Entrants (firms in the industry in 1979 but not in 1970)

ENBLD	those firms that entered the industry by building one or more plants between 1970 and 1979.
ENMERG	those firms that entered the industry by acquiring one or more plants between 1970 and 1979.

Exits (firms in the industry in 1970 but not in 1979)

EXSCRP	those firms that left the industry by scrapping plants between 1970 and 1979.
EXSELL	those firms that left the industry by selling plant to another firm between 1970 and 1979.

Continuing (firms in the industry in 1970 and 1979)

CONSELL	those continuing firms (extant in both 1970 and 1979) that divested themselves of one or more plants between 1970 and 1979.
CONMERG	those continuing firms that acquired one or more plants in the same industry between 1970 and 1979.
CONBLD	those continuing firms that built one or more plants in the same industry between 1970 and 1979.
CONSCRP	those continuing firms that scrapped one or more plants between 1970 and 1979.
CON	those continuing firms that owned at least one plant in the industry in both 1970 and 1979.

Table 10 summarizes the number of firms and plants in each of these categories in 1970 and 1979 averaged across the manufacturing sector.[8] Since the absolute value of the number of firms in each category may not fully capture the importance of the merger process, Table 11 is included to show the relative proportion of firms in each category and the relative proportion of their new, acquired, divested, and scrapped plants' sales in relation to industry totals.[9]

Entry by acquisition, or the diversified merger, is an important part of the entry process. While about one-fifth of entrants do so by merger (Table 10), the share of shipments as of 1979 accounted for by the plants so acquired is almost as large as that of entrants newly-created plants (Table 11). The greater significance of entry by merger when measured in terms of shipments is the result of a significant difference in the size of plants in the two categories. On average, entrants' newly created plant had 53.5 employees while plants acquired by entrants had 156.6 employees. Moreover, the entrant in the former category generally was single establishment, while entrants via merger acquired on average 1.5 plants per firm -- a result consistent with the inferences drawn from Table 9 about the importance of multi-establishment take-overs. Diversified mergers then are an important factor in the entry process and an attempt to restrict them would probably have a detrimental effect on the extent to which new potentially dynamic participants emerge in an industry.

Horizontal mergers were a significant contributor to the expansion process of existing firms. On average, about the same number of continuing firms acquired plant in the same industry as built new plant (3.1 and 3.9 respectively, Table 10). The share of

shipments accounted for by the plants of continuing firms that were acquired and newly-built were also about the same by the end of the decade (Table 11).

If diversified mergers are compared to horizontal mergers, the former process is revealed to be the more important. On average, 4.9 firms entered by acquiring plant while 3.1 continuing firms expanded by purchasing existing plant (Table 10). The former accounted for 5.9 per cent of the number of firms but 12.3 per cent of shipments as of 1979 (Table 11); the latter for 2.1 per cent of firms but only 3.2 per cent of shipments. From this, we can infer that most of the larger mergers caught by the aggregate data presented in the previous section were the result of diversified and not of horizontal mergers.

The two merger processes can be further compared by examining the characteristics of those plants taken over by each type of merger. The characteristics that we compare are average size (sales), diversity of products produced (measured as the sum of squares of the share of the plants' output in each product line, the herfindahl index), average production run length (sales divided by the herfindahl created number of products equivalent), productivity (value added per worker), profitability (profit/sales ratio) and average wage paid. Because the plant size distribution may not be normal, both the arithmetic means and the geometric means for size relatives are reported. Examination of the relative characteristics other than size revealed a symmetric bell-shaped distribution in the untransformed relatives and therefore only the arithmetic mean of the ratio is reported for these characteristics.

Table 12 compares the plants as of 1979 that were acquired by entering firms (diversified mergers) or by continuing firms

(horizontal mergers), to one another (ENMERG/CONMERG; column I) and to the plants as of 1979 that remained with the firms that continued in the industry throughout the decade -- ENMERG/CON; column II and CONMERG/CON; column III. Table 13 compares the plants as of 1970 that were divested by exiting firms or by continuing firms, to one another (EXSELL/CONSELL; column I) and to the plants as of 1970 that were to remain with the firms that continued in the industry throughout the decade -- EXSELL/CON; columns II and CONSELL/CON; column III. Comparisons of the characteristics of acquired plant are done for 1979; of divested plant for 1970. By examining changes in the position of divested plant as of 1970 and acquired plant as of 1979 relative to continuing plants, conclusions about the effect of the merger process can be drawn.

Diversified and horizontal mergers involved plant that was on average significantly larger than continuing plants of continuing firms (columns II and III of Table 12). Moreover firms that entered by merger did so by acquiring relatively larger plant than existing firms that acquired plant (column I, Table 12). Generally, there were no significant differences with regards to diversity of products -- either for divested plants or for acquired plants. Therefore, the conclusions as to relative length of production run are similar to those for average size. Divested plant production runs are longer than those of the continuing plants of continuing firms and so too are the production runs of acquired plants. The production runs of the two types of divested plant are not significantly different from one another but by 1979 the run-length of plants acquired by entering firms is greater than for plants acquired by existing firms.

Diversified mergers therefore appear to be taking advantage of unexploited production run-length economies.

Productivity differences, when measured by value added per worker, are not significant, for either divested or acquired plant. Moreover, while profitability (profits/sales) for the two types of divested plant is not significantly different from that of continuing firms in 1970 (columns II and III, Table 13), plants acquired by entrants have become significantly more profitable than continuing plants of continuing firms by 1979 (column II, Table 12). This however is not true of the acquired plants involved in horizontal mergers which by 1979 are no more profitable than continuing plants (column III, Table 12).

This improvement in profitability for diversified but not for horizontal mergers does not appear to have been the result of changing wage rates. In 1970, only divested plants of exiting firms had lower wage rates than continuing plants (column II, Table 13), while by 1979, both acquisition categories -- diversified and horizontal -- had lower wage rates than continuing plants (columns II and III, Table 12). Moreover, in neither year was the average wage paid by the two types of divested plant or the two types of acquired plant significantly different (column 1, Tables 12 and 13). Thus new firms managed to either pick those firms that yielded a higher return or by their very acquisition increased the return to capital.

A comparison of the profitability of the two types of divested plant and of acquired plant indicates that plant of exiting and entering firms were more profitable than the divested or acquired plant of continuing firms but not significantly so (column 1, Tables 12 and 13). The superior profitability of plant acquired by entering firms relative to continuing firms' plant must therefore be attributed

to those industries where there were no horizontal acquisitions (there are twice as many observations for column II as for columns I and III, Tables 12 and 13). Thus on average diversification mergers must be classified as successful -- at least on the grounds of profitability.

In conclusion, when viewed as a component of the entry process, diversified mergers rank equally with entry by new plant creation. By the end of the decade, an average of some 13 per cent of sales were accounted for by establishments that had been acquired by firms that were not in the industry at the beginning of the decade. These plants were more than twice as important (in terms of percentage of sales) as those establishments that were acquired by horizontal mergers. To the extent that entrants add new ideas or to the extent that ownership turnover breaks down existing understandings that permit tight oligopolies to coordinate behaviour, then the merger process can be said to have been beneficial.

The relative importance of diversified mergers is particularly significant in light of the work of Berry (1975). While he noted that diversification by merger only results in a different and not a new competitor, he did observe that in his sample of large U.S. enterprises, diversification tended to reduce and not increase concentration (Ibid., p. 157). Structural imperfections relate to the notion of some barrier, either to entry or inter-class size mobility barriers (Caves and Porter, 1977). In related work, we have shown that entrants that build new plants tend to be small relative to continuing firms. To the extent that there are substantial mobility barriers across size classes, then entry by new plant creation may

have little impact upon larger firms. However, entrants that do so by acquiring plants are larger. Thus it is the diversification merger process that is more likely to place competitive pressure on the largest size classes.

The data also show that horizontal mergers were not the only way by which existing firms expand market share. During the decade of the seventies, continuing enterprises increased their share of sales by about 4.5 percentage points (from 69.3 to 73.8 per cent -- Table 11). About half of this (2.1 percentage points) was due to the growth of establishments that remained with continuing firms throughout the period. About 0.4 percentage points was due to net new plant creation (births minus deaths). The remaining 2 percentage points was due to net acquisitions. Therefore about half the growth in the share of the continuing segment came from horizontal mergers.

Finally, the characteristics of the plants acquired by both entering and continuing firms confirm the earlier more aggregative data that merger activity is indeed concentrated in the upper tail of the establishment size distribution. But the largest acquisitions are being made as a result of the diversification process. However, contrary to earlier suggestions by the Royal Commission on Corporate Concentration (1978) that diversified mergers are relatively unsuccessful, we find that plants that are acquired as part of these mergers were relatively more profitable than continuing establishments of continuing firms by the end of the decade. By way of contrast, horizontal mergers were not more profitable.

IV An Examination of the 'Determinants' of the Merger Process

We now turn to regression analysis to investigate which variables are related to the merger processes. While the industry averages reported above reveal much about the underlying process that is determining structural change, they also conceal a great deal. It is possible that entry by plant creation and by merger are not equally important in all industries. The traditional industrial organization literature stresses the connection between performance and entry barriers. And several applied studies have found that entry (defined as the net number of firms) is inversely related to such barriers (Orr 1974a, Gorecki 1976). But the data in these studies did not allow previous authors to test whether this phenomenon just affects plant creation or also the entry of firms by acquisition. It is conceivable that entry by new plant creation may be negatively affected by commonly conceived entry barriers but that entry by merger is not. If the latter occurs more frequently where concentration is higher, then it can be argued that mergers overcome traditional entry barriers. Similarly the plant expansion process by continuing firms via plant creation as opposed to plant acquisition may differ significantly depending upon the concentration of an industry. If horizontal mergers do not primarily occur in industries where concentration is high, then it is more difficult to argue that they exacerbate existing market imperfections. Most previous cross-sectional studies of the merger process have not been able to examine this phenomenon -- because the merger type was missing so that horizontal mergers could not be separated from mergers that effected entry and because the merger process could not be compared to plant creation activity.

A) The Model

Since the merger process can be regarded as an alternative to entry by new plant creation or expansion by existing firms, entry models provide the frame of reference used in this study. While the entry literature[10] is not as extensive as the applied work on structure-conduct-performance, it is more structured than that used in most previous cross-sectional investigations of merger intensity (Gort 1969, Globerman 1977). In this paper, we adopt a model that we previously applied to the entry and exit process in the Canadian manufacturing sector (Baldwin and Gorecki, 1983a).

The estimating relationship used is

$$1) \qquad E_t = a_0 + a_1 N_t + a_2 G_t + a_3 (PP_t - PN_t).$$

where $E \equiv$ number of entrants

$N \equiv$ number of firms in the industry

$G \equiv$ room for new firms as a result of growth

$PP \equiv$ perceived profitability after entry

$PN \equiv$ opportunity cost of capital.

Entry is assumed to respond to a signal that entrants can expect to make positive profits -- as others have done. But, in contrast with the traditional approach, entry is not regarded as being blockaded even if traditional signals indicate that profits are no greater than normal. Entry is assumed to be a dynamic process involving both the partial and complete replacement of existing firms.

Variables that are meant to capture this dynamic process must reflect the likelihood that entrants will replace old firms or that they can enter and capture part of the market irrespective of the level of profits being earned in the industry. Two variables -- existing number of firms and market growth -- are used to capture that part of the entry process that is not directly related to profitability.

The number of firms (N) is entered to capture the primary determinants of the replacement process that is an integral part of entry. New firms are assumed to replace existing firms because of new or better products or because of more efficient production processes. If each firm in an industry is assumed to have a probability a_1 of being replaced, then a_1N represents this effect on entry. The probability of replacement is allowed to vary industry by industry. The degree to which a new firm can expect to replace an existing one should be a function of the inertia of customers. Two characteristics of an industry are hypothesized to have a significant effect on the probability of replacement -- research and development intensity (RD) and advertising intensity (AD). The traditional entry barrier literature has suggested these variables are correlated with first mover advantage. Both variables are introduced by creating an interaction term with number of firms N.

Growth (G) is entered in (1) to capture a second aspect of the stochastic entry process. The ease of entry depends upon the degree to which a new firm can expect to have its products sampled by customers. A growing market is more likely to be associated with new customers whose brand loyalty is not fixed and therefore there is a greater likelihood of new firms capturing market share. The

effect of growth is assumed to depend upon the extent to which economies of scale exist in the industry. That is, the room for new firms should be measured by real growth divided by a measure of minimum efficient scale (MES).

The third term in the entry model (#1) captures the disequilibrium effect of abnormal profitability. Since the difference between the expected post-entry profitability and the opportunity cost of capital (PP-PN) is not directly observable, a proxy is required. Potential entrants are assumed to base their expected post entry profitability on the existing profit rate (P_a) less a margin occasioned by the costs of entry. This margin is determined by the same factors that govern the height of what the limit pricing literature has referred to as the entry blockading profit level less the opportunity cost of capital (Pf-PN) and is written as a function of a vector of entry barriers (B). In addition, the opportunity cost of capital PN is assumed to be determined by the risk free level of profitability f_0 and a vector of the risk characteristics of the industry (R). This then allows (1) to be written as

$$2) \qquad E_t = a_0 + a_1 N_t + a_2 G_t + a_3 P_{at} + a_4 B_t + a_5 R_t.$$

It is this equation that we use to estimate both entry by plant creation and by plant acquisition.[11] We use the same format to examine the determinants of the decision by continuing firms to create new plants as opposed to acquiring plants. In each case the dependent variable is the number of firms (defined as unconsolidated enterprises) that engaged in a particular activity.[12]

Any examination of the merger process and its relationship to entry cannot ignore the extent of foreign-controlled operations in Canada. On average, almost half of each manufacturing industry's output is accounted for by foreign-controlled firms. Since previous work (Gorecki [1976]) suggests that entry by these two types of firms do not respond in the same way to industry characteristics, we have broken the entry and merger data into two -- one for domestic-controlled and one for foreign-controlled firms.[13]

B) Variables

The explanatory variables used in the regression analysis are reported in Appendix A.[14] They can be broken into four groups. The first contains measures of the size of the industry -- N_t in equations 1 and 2. The variable used is the number of firms (N). Because it was felt that the replacement process might differ for foreign as opposed to domestic firms, total number of firms (N) are broken into domestic firms (NC) and foreign firms (NF). In addition interactions between firm numbers and advertising (NTD1) and firm numbers and research and development (NTD2) are included.

The second group contains those variables that measure the room for new entrants derived from growth or a change in minimum efficient scale plant (MES) -- G_t in equations 1 and 2. These variables are export growth (GX), import growth (GM), domestic production growth (GT), and domestic sales growth GD. (Note that GT = GD - GM + GX.) Also included is a variable meant to measure the effect of changing MES (EXCESS).

The third group of variables is intended to capture the joint

effect of profitability (P) and entry barriers (B) and the risk characteristics (R) in equation 2. These involve a variable that combined a measure of average industry profitability and the degree to which small firms are disadvantaged relative to large firms (PCONB),[15] concentration due to plant economies (ES), concentration due to economies of the firm other than plant economies (RCR),[16] the disadvantage of small as opposed to large plants (CDR), advertising intensity (AD) and research and development intensity (RD).

Finally, the fourth group contains a miscellaneous set -- a regional variable (REG); a variability of demand variable (VAR); and a trade variable, import significance (M).[17]

C) The Estimation Procedure

The entry model derived in equation (2) provides a potential estimation problem. Profitability can be treated as exogenous because it can be hypothesized to depend upon past growth and entry. However, the existing number of firms depends upon previous entry and therefore upon entry barriers. Not all of these barriers will have been captured exactly in the barriers variables used and thus part of this effect will reside in the error terms of the entry equation and of the equation determining the number of firms at the beginning of the period. Since the error terms that affect past entry and therefore total number of firms and present entry are very likely correlated over time, N_t is not independent of the error term.

One solution would be to use a reduced form with N_t replaced by a function of the sum of past growth (total sales (SALES) at the beginning of the period) and entry barriers.[18] Alternately, a

simultaneous equatons approach could be used.

Because none of the estimation techniques is clearly superior a priori, all three were carried out to test the robustness of the results. Both ordinary least squares and two stage least squares were used for the structural model (#2) while ordinary least squares was used for the reduced form of the relationship where number of existing firms (N) is replaced with the variable SALES. The two stage least squares regression treated only existing number of firms as endogenous. The results for the three different methods were sufficiently similar that only the OLS results of the structural equation are reported subsequently.[19]

In the subsequent discussion of each equation, the significance levels, which would just allow rejection of the null hypothesis that the coefficient is zero, are given in each table. These are two-tailed tests of significance. In the following discussion, a variable is referred to as significant when the significance level is 5 per cent or less. Weakly significant variables are those between 5 and 10 per cent. This standard was chosen because in each reported run not all insignificant variables are excluded. When the highly insignificant variables were excluded, the significant or weakly significant variables by this standard did not change their signs (or their estimated values by much) but did have their significance levels increased substantially.

D) The Results

The results of the regression analysis for the entry process are reported in Table 14 for Canadian firms and in Table 15 for

foreign firms. The plant expansion process is reported in Tables 16 and 17 for Canadian and foreign firms respectively.

a) Entry (Merger vs. Plant Creation)

(i) Domestic Firms (Table 14)

Both entry processes by domestic firms strongly depend on the existing number of firms (NC, NF) and on the growth of the market (GX, GM, GT).[20] However, there are significant differences in the response of these two forms of entry even here. Entry by plant creation reacts significantly to more of the growth variables than does entry by merger. The latter is significantly influenced only by the trade growth variables (GX, GM) and not domestic growth (GT) or the rationalization variable (EXCESS).

Entry via plant creation is negatively related in a significant way to the two interaction entry barrier variables -- advertising (NTD1) and R and D (NTD2). This is not true of merger entry. This difference can also be found in the responses to the entry barrier variables. Entry by plant creation is negatively, though not significantly, related to the plant economies concentration variable (ES) and the firm concentration variable (RCR). It should also be noted that neither of these collinear variables is significant when included on its own. On the other hand, merger entry is positively related to one concentration variable (RCR) and the effect becomes highly significant with the omission of the highly collinear plant scale concentration variable (ES). These results suggest that entry by merger overcomes entry barriers and thus is potentially pro-competitive.

The two entry processes differ in their response to the profitability variable (PCOMB). While they both react to this variable with the expected sign, only merger entry has a significant coefficient. Once more this suggests that the merger process may be an important contributor to the equilibrating process -- at least to the extent it adds new participants who expand production to take account of profitable opportunities. Together with the characteristics data previously presented, this suggests entry by merger is concentrated in the more profitable industries with higher entry barriers; that the acquired plants were no more profitable than average at the beginning of the period but have become so at the end.

(ii) Foreign Firms (Table 15)

The two forms of the foreign firm entry process are more similar than the two domestic ones. Foreign firms, whether they enter by plant creation or acquisition, generally do not respond to the growth or profitability variables that their domestic counterparts did. This is consistent with the view that global rather domestic considerations dominate foreign firm entry decisions.

Entry for both foreign new plant creation and acquisitions is greater and more significant where there are more foreign firms (NF) than where there are domestic firms (NC). This suggests that foreign firms continue to favour the same sectors that they did in the past.

It should be noted that both foreign entry processes are concentrated more in industries with the traditional scale barriers (ES, RCR). However, only entry by merger has a significant positive coefficient on both variables. Moreover this category is negatively

related in a significant fashion to the cost disadvantage ratio (CDR). Thus foreign firm merger entry is greater in those concentrated industries where smaller firms have a cost disadvantage. Once again the merger process may be said to overcome entry barriers.

(b) Expansion (Merger vs. Plant Creation)

(i) Domestic Firms (Table 16)

The domestic expansion process via plant creation as opposed to merger shows similar significant responses to export growth (GX). However horizontal mergers were significantly greater where domestic growth was less (GT) and also where the increase in MES (EXCESS) was greater. This suggests the horizontal merger process is related to rationalization.

Both plant creation and acquisitions respond favourably to the profitability variable (PCOMB) -- in the case of the former, the coefficient is weakly significant; in the latter case, it is highly significant. In this respect, they resemble the domestic merger entry process. Thus three of the four domestic entry and expansion mechanisms respond to profitability incentives.

Both expansion processes are higher in concentrated industries (RCR). In both cases the level of significance of the concentration variable (RCR) reported in Table 15 increases to become highly significant if the plant scale variable (ES) which is collinear with RCR is removed. It should however be noted that the horizontal acquisition process is not significantly related to industries where concentration is high because of plant scale (ES). This suggests it is the contribution of the multiplant nature of the industry to

concentration (see Appendix A for definition of RCR) that is influencing the horizontal merger process. This is born out by the significant coefficient attached to the regional dummy (REG). Thus horizontal mergers are probably facilitating coordination of production in geographically-fragmented rather than national markets. Since the former already possess some market power, horizontal mergers probably have little detrimental impact if they only extend new firms into these markets.

(ii) Foreign Firms (Table 17)

The foreign acquisition and plant expansion process is similar to the domestic in that both respond to growth and profit opportunities. But as with the difference between the domestic and foreign entry process, the foreign response in this case is somewhat weaker. Both the foreign continuing firm plant creation and acquisition processes only respond in any significant fashion to export growth (GX). While the sign on the profitability variable (PCOMB) is correct, it is significant only at the 12 per cent level.

Foreign horizontal acquisitions and plant creation are concentrated in the foreign controlled sectors. The coefficient on number of foreign firms (NF) is highly significant, that on the number of Canadian firms (NC) is not. Thus the foreign expansion process is confined to the foreign controlled sector.

The difference in the size and significance of the coefficients on NF and NC also existed for the foreign entry process, but it was less marked. Indeed entry by acquisition as shown in Table 15 was significantly related to the number of Canadian firms (NC).

Earlier, we observed that foreign acquiring firms gradually shifted over the decade from acquiring foreign to acquiring domestic controlled firms. The lack of significance of NC for horizontal mergers but its significance for foreign firms entering via merger suggest these acquisitions were not directed at horizontal expansion as much as entry into new sectors.

The foreign continuing firm expansion process via new plant creation as opposed to horizontal merger has the same relationship to the plant scale concentration (ES) and the firm concentration variables (RCR) as does the domestic firm expansion process. But foreign acquisitions are negatively related in a significant fashion to plant scale concentration (ES is highly significant when RCR is removed). Thus foreign horizontal mergers are not concentrated in those industries where concentration is already high because of large plant scale. In contrast to domestic horizontal mergers, foreign horizontal acquisitions are not concentrated in regional industries (REG).

E) Summary

These results indicate there is merit in examining the merger process as an alternative to either plant creation by entrants or by existing firms. There are enough similarities to suggest that many of the same considerations that lead new or existing firms to build plants also affect their decision to acquire firms. Placing the merger process in this context also provides a standard of comparison that is lacking in previous cross-sectional studies of mergers.

For example, we find that mergers are related to profitability; but so is new plant creation by existing firms. In

light of this similarity, the argument that mergers in some sense create higher profits through the creation of market power is less credible.

Our work also sheds light on the earlier claim by the RCCC (1978) that there was a strong relationship between merger intensity and growth in average firm size. The Commission argued that this indicated that mergers were in part "undertaken to secure real and/or pecuniary economies of scale" (p. 145). But the RCCC work did not distinguish between growth per se and a change in plant size. When this is done, our evidence supports this interpretation -- but only for domestic horizontal mergers. That there are fewer new plants created by continuing domestic firms when MES plant is increasing and more domestic horizontal mergers at the same time strengthens the contention that mergers are part of a rationalization process.

The importance of distinguishing between entry by merger as opposed to expansion by merger is also demonstrated by our work. In previous work that did not do so, Globerman (1977) found a strong positive correlation between merger intensity and concentration. This led two observers (Stanbury and Waverman 1979, p. 117) to conclude that this "should at least lead one to view increases in monopoly power as a possible result of merger activity". Our results suggest the case for doing so is much less clear. While diversified mergers are related to concentration, it is not obvious that this is detrimental; for it can be said to have certain benefits that offset problems with the plant entry process. It introduces new participants into that section of the plant size distribution exactly where the plant creation process does not.

Domestic horizontal mergers and foreign horizontal mergers are both negatively related to that concentration which arises from larger plant scale. In this sense, mergers are not focused on concentrated industries. Where horizontal mergers are related to concentration (the domestic sector), the latter is related to the relative multiplant nature of the leading firms and their regional nature.

The division of the data into foreign and domestically controlled firms used in this paper also illustrates the extent to which it is difficult to generalize about the merger process without considering the basic differences in the two sectors. Foreign entry mergers are less affected by the incentive variables (growth and profitability); but they are greater where variables said traditionally to represent entry barriers are high. With respect to horizontal mergers, foreign mergers are less significantly related to concentrated industries. On both counts, the foreign activity would appear therefore to be less harmful than domestic.

V Some Implications

We draw several conclusions from our results based upon the experience of the 1970s. First the merger process is not an aberrant one that is dramatically changing the structure of the manufacturing economy. Horizontal mergers have decreased in importance. Their distribution across the domestic and foreign-owned segment reflects the importance of these sectors and thus suggests a certain commonality of purpose. While smaller firms are more likely to be acquired by larger ones, there is sufficient intra-class merger activity to suggest it strengthens small firms' ability to compete. In addition, both entry by merger and expansion by merger responds to

much the same forces as new plant creation. Second, where there are differences between the merger and the plant creation process, they are not such as to cause consternation. Indeed the opposite is the case. That entry by merger is positively correlated with entry barriers suggests it performs a valuable function of permitting new entrants where the traditional literature has claimed competition may not be intense. That horizontal mergers are associated with rationalization suggests efficiency gains from these mergers may be important.

At the beginning of the paper we suggested that the arguments made by those for and by those against merger policy changes lacked sufficient evidence for a disinterested observer to make a choice between the two. This may account, in part, for the lack of success in passing legislative changes in merger legislation since 1971.

The evidence cited in this paper is meant to help the debate. But it is certainly not definitive. We still desperately require the sort of studies recommended in the Skeoch-Macdonald (1976, pp. 48-49) Report, but which have never been carried out.

Nevertheless, we believe this paper does permit one to obtain an empirical picture and a better understanding of the merger process. It does not exclusively support the arguments of either of the two schools of thought. Mergers appear to be part of an ongoing process symptomatic of a healthy economy. Hence a broad based net is probably inappropriate. Nevertheless, this does not mean mergers have no competitive consequences. The data on size distributions of firms engaged in the merger process not only show that some small firms have gained but so also have large firms. We suggest that the

evidence presented here emphasizes the need to be extremel selective in devising a merger policy. Of course, this is a necessary but not a sufficient condition for policy intervention.

APPENDIX

1) Acknowledgements

The authors wish to acknowledge the commitment of Statistics Canada to the creation of the data base used in this paper. Without the support of the Statistics Canada and the effort of J. McVey, the extensive data base used in this and accompanying papers would not have been collected. In addition, the School of Graduate Studies at Queen's University helped with support. The data in section II was kindly made available by M. Cappe of Consumer and Corporate Affairs. The calculations were also made by J. McVey of Statistics Canada.

2) Data

The data on entry and exits and mergers were collected by labelling all establishments with an identification code. With this identification scheme, the plants or establishments in each Canadian four-digit SIC manufacturing industry in either or both 1970 and 1979 were classified, on the one hand as being divested, acquired, born, dead, or continuing and, on the other hand, as belonging to a firm that was in existence at both the beginning (1970) and end (1979) of the period (a continuing firm), only at the end of the period (a new firm), or only at the beginning of the period (a dead firm).

While the coverage of manufacturing firms provided by the data base is more extensive than has been previously used, it does miss some plants. Those that are born after 1970 and die before the end of period are omitted and only acquisitions of continuing establishments

are included in the acquisition category. This means that new establishments that are subsequently merged are included as births but not as mergers. Similarly only divestitures of continuing plants are treated as divestitures. Those that are divested and then exit are treated only as exits. The second shortcoming of the data is that it covers only those plants that were "large".[21] Nonetheless these plants account for the preponderance of industry sales -- some 98.5 per cent of sales in manufacturing in 1970.

The data used for the merger characteristics in section 1 essentially come from the same data base. Each establishment was also given a code that indicated the unconsolidated group to which it belonged at the four-digit SIC level and a code that identified the consolidated enterprise and its SIC class that owned it in turn. This allowed the various constituents of each consolidated enterprise to be identified and compared to those of all unconsolidated enterprises acquired for the determination of whether a merger was horizontal. In turn the characteristics (size, etc.) of both acquiring and acquired enterprises (on a consolidated or unconsolidated basis) could be calculated either for the year of acquisition or at the end point of the study (1979 in this case).

The data for all industry variables were collected for the universe of 167 4 digit Canadian manufacturing industries. Contrary to other recent studies (Caves et al. 1980) the data base did not have to exclude observations that Statistics Canada did not publically report for reasons of confidentiality. However, in a small number of cases, data on certain variables were not available at the 4-digit level but at a somewhat more aggregative level of industry

classification, thus necessitating some spreading. Nominal and effective tariffs and advertising variables were based on a 122 industry division of the manufacturing sector. Research and development statistics were available only at the 3-digit level, which divides the manufacturing sector into 112 industries. Finally, the trade data needed some minor prorating for 21 of the 4 digit industries. An appendix is available from the authors that details the data base and its sources.

3) Variable List and Definitions

a) Size of Industry Variables

N The number of unconsolidated firms in the industry as of 1970 where the unconsolidated firm is defined as a grouping of all plants assigned to that industry that are under common ownership.

NC The number of Canadian owned unconsolidated firms in an industry as of 1970.

NF The number of foreign owned unconsolidated firms in an industry as of 1970.

NTD1 An interaction term defined as the number of unconsolidated firms in an industry as of 1970 multiplied by a dummy variable that takes on a value of 1 when the advertising variable takes on a value greater than its mean.

NTD2 An interaction term defined as the number of unconsolidated firms in an industry as of 1970 multiplied by a dummy variable that takes on a value of 1 when the research and development variable takes on a value greater than its mean.

SALES The total value of industry sales in 1970 divided by the 1970 estimate of minimum efficient scale of plant (MES). Minimum efficient scale is defined as the average size of the largest plants that account for 50 per cent of industry sales. The SALES variable replaced N, or NC and NF in the reduced form equation.

b) Growth Variables

GT — The real growth in domestic production between 1970 and 1979 divided by the 1970 estimate of MES.

GM — The real growth in imports between 1970 and 1979 divided by the 1970 estimate of MES.

GX — The real growth in exports between 1970 and 1979 divided by the 1970 estimate of MES.

GD — The real growth in domestic sales between 1970 and 1979 divided by the 1970 estimate of MES.

EXCESS — The value of industry production in 1979 divided by the change in MES between 1970 and 1979 where both numerator and denominator are expressed in 1970 dollars. This variable therefore declines when MES increases.

GTRD — A variable meant to capture the interaction between growth and research and development is defined as the real growth of industry sales, divided by MES (GT), multiplied by a dummy variable which takes on a value of 1 when the research and development variable takes on a value greater than its mean for 1970.

GTAD — A variable meant to capture the interaction between growth and advertising is defined as the real growth of industry sales divided by MES (GT), multiplied by a dummy variable which takes on a value of 1 when the advertising variable takes on a value greater than its mean for 1970.

c) Profitability Variables

PB — The gross rate of return defined as total activity value added less wages and salaries divided by industry gross capital stock for 1970. This is a measure of beginning year profitability.

PCOMB — A measure of profitability that combines overall profitability along with a measure of how well small firms do relative to large firms. Defined as (PCON - 1.00) x(-PDIF). It varies inversely with the difference between large and small firm profitability and directly with overall profitability. Its expected sign is positive.

PCON — The weighted gross rate of return (PB) in 1970 of all firms that continued in the industry throughout the decade.[22]

PDIF — The difference between the gross rate of return (PB) of the top half of the industry, ranked on the basis of size, and the gross rate of the bottom half, as of 1970.

CVAR — The coefficient of variation of the net margins/sales ratio for 1970. Net margin is total activity value added less wages and salaries. This is a measure of risk. The lower the average return and the greater the dispersion, the more likely are firms to be earning returns that do not meet the opportunity cost of capital.

PNEG — The relative proportion of small firms with negative net margins. Small firms are defined as those accounting for the bottom 50 per cent of employment. This is another risk measure that should proxy the probability of failure.

RG1 — Overall profit growth rate defined as the ratio of average industry gross rate of return in 1979 to 1970.

RG3 — Large firm profit growth rate defined as the ratio of large firm (top half of employment) gross rate of return in 1979 to 1970.

RG6 — Small firm profit growth rate defined as the ratio of small firm (bottom half of employment) gross rate of return in 1979 to 1970.

d) Barriers to Entry Variables

ES — The importance of plant economies defined as the ratio of minimum efficient scale to domestic market size, 1970.

CDR — The disadvantage of small as opposed to large plants defined as the ratio of value added per man-hour for small plants over that for large plants in 1970, times a dummy that takes on a value of 1 where SALES is greater than its mean and 0 otherwise. See Caves et al. (1975) (1980), Baldwin and Gorecki (1983b).

RCR — A firm level economies variable that is defined as the difference between the four firm concentration ratio and four times the ratio of minimum efficient scale plant to industry sales for 1970. This is meant to purge the concentration ratio of the effects of high MES/SALES ratios and thus capture residual effects of firm economies. See Baldwin and Gorecki (1983a) for further discussion.

AD — A product differentiation variable defined as the advertising sales ratio multiplied by a dummy variable that takes a value of 1 for all consumer non-durable goods industries, 1970.

RD A research and development variable defined as the ratio of research and development personnel to all wage and salary earners, 1975.

e) Other Variables

REG A regional dummy variable taking on the value of 1 when the industry is judged to be regional in nature.

VAR A variability of demand variable defined as the standard deviation of real value of shipments around the logarithmic regression of shipments on time for the period 1970-79.

M The proportion of domestic disappearance accounted for by imports as of 1971.

CA The comparative advantage of the industry, defined as exports minus imports divided by the sum of exports plus imports as of 1971.

FO A variable measuring foreign ownership and defined as the proportion of industry sales accounted for by foreign controlled firms as of 1970.

TABLE 1

The Relative Importance of Horizontal Mergers in the Manufacturing Sector

(%)

	1945-61	1971-73	1974-76	1977-79
	I	II	III	IV
Horizontal	68	61	47	39
Vertical and Conglomerate	32	39	53	61

Notes:

1) The Statistics Canada tabulations used for the basis of this analysis, all unconsolidated enterprises. A horizontal merger was defined to occur when the acquiring consolidated enterprise possessed an unconsolidated enterprise in the same industry (2-digit) as the acquired enterprise. All other mergers were defined by default as vertical or conglomerate.

2) While the definitions of the two types of mergers used here differ between column I and columns II to IV, the affect of this is not likely to be very important. If anything, Reuber and Roseman's definition might bias upward the number of horizontal mergers relative to the definitions used in columns II to IV because they include mergers between firms producing 'competing but different materials' (p. 86).

Source: Column I, The Royal Commission on Corporate Concentration (1978, Table 6.4, p. 147), based on Reuber and Roseman (1969, Table 5.3, p. 87).
Columns II-IV, Special Tabulations by Statistics Canada.

TABLE 2

A Comparison of the Relative Importance of Domestic and Foreign Merger Activity in the Manufacturing Sector: 1971-79

Category	By Number of Acquired Firms I (%)	By Value of Shipments of Acquired Firms ($1979) II (%)	By Employment of Acquired Firms (Salaried and Wage Earners (1979) III (%)
Cdn acq. Cdn	42.8	45.6	44.1
Cdn acq. Foreign	13.5	16.7	16.4
Foreign acq. Cdn	22.6	13.0	13.8
Foreign acq. Foreign	21.2	24.6	25.7
Total	100.0	100.0	100.0

Note: Each unconsolidated enterprise acquired (defined at the 4 digit level) is counted as a merger, - even though more than one such enterprise (i.e. in two different 4 digit industries) may have been acquired in the merger transaction.

Source: Statistics Canada: Special Tabulations.

TABLE 3

The Relative Importance of Domestic and Foreign Merger Activity in the Manufacturing Sector by Sub-periods, 1971-79

(percentage of number of acquired firms)

Category	Sub-period 1971-73 I	1974-76 II	1977-79 III
A. Cdn acq. Cdn	44.2	42.3	41.4
Cdn acq. Foreign	14.4	14.0	11.6
Foreign acq. Cdn	16.4	24.8	28.7
Foreign acq. Foreign	25.0	18.9	18.3
	100.0	100.0	100.0
B. By Acquiring Firm			
Cdn	58.6	56.3	53.1
Foreign	41.4	43.7	46.9
	100.0	100.0	100.0
C. By Acquired Firm			
Cdn	60.6	67.1	70.2
Foreign	39.4	32.9	29.8
	100.0	100.0	100.0

Note: The basic unit used is defined in Table 2.

Source: Statistics Canada: Special Tabulations

TABLE 4

The Relative Importance of Domestic and Foreign Merger Activity in the Manufacturing Sector by Sub-periods, 1971-1979

(percentage of employment in acquired firms)

Category	Sub-period 1971-73 I	1974-76 II	1977-79 III	1974-79 IV
A. Cdn acq. Cdn	44.2	42.3	41.4	45.0
Cdn acq. Foreign	14.4	14.0	11.6	15.4
Foreign acq. Cdn	16.4	24.8	28.7	18.3
Foreign acq. Foreign	25.0	18.9	18.3	21.3
	100.0	100.0	100.0	100.0
B. By Acquiring Firm				
Cdn	60.7	68.6	48.0	60.3
Foreign	41.4	31.3	51.9	39.7
	100.0	100.0	100.0	100.0
C. By Acquired Firm				
Cdn	50.4	64.5	61.4	63.3
Foreign	49.5	35.4	38.5	36.7
	100.0	100.0	100.0	100.0

Note: The basic unit used is defined in Table 2.

Source: Statistics Canada: Special Tabulations

TABLE 5

Size Distribution and Other Characteristics of Acquired Firms in the Manufacturing Sector During the 1970s

Size Class of Employees	ACQUIRED FIRMS					
	No. of Acquisitions I (%)	Value of Shipments II (%)	Employment (wages & salaries) III (%)	Average Size of Enterprise (employment) IV	Average Size of Establishment (employment) V	Establishments/ Enterprise VI
<50	47.5	7.5	6.9	24	24	1.02
50-99	18.5	7.1	7.9	71	61	1.16
100-199	16.7	13.4	14.1	140	112	1.26
200-499	11.2	19.4	21.4	317	172	1.84
500-999	3.8	14.3	15.4	669	203	3.30
1000-1499	1.0	8.3	7.7	1237	260	4.75
1500 +	1.1	29.8	26.6	3729	282	13.20
	100.0	100.0	100.0			

Note: For the purpose of this analysis, acquired firms were defined as consolidated enterprises -- that is, all owned establishments of the acquired unit. All measurements are as of 1979.

Source: Columns I-VI: Statistics Canada, Special Tabulations.

TABLE 6

Distribution of Size of Acquisitions for Each Size Class of Acquiring Firms (By Employment-Wage and Salary Earners); in the Manufacturing Sector During the 1970s

(%)

Employment Size Class of Acquired Firms	EMPLOYMENT SIZE CLASS OF ACQUIRING FIRMS							
	0-100 (I)	101-200 (II)	201-500 (III)	501-1000 (IV)	1001-1500 (V)	1501-2500 (VI)	2501-5000 (VII)	5000+ (VIII)
0-100	67.8	30.9	19.0	10.7	9.1	7.8	4.8	3.7
101-200	9.6	21.7	15.1	15.1	7.7	9.6	5.7	4.4
201-500	2.6	13.3	29.9	22.6	20.8	22.6	15.0	7.6
501-1000	7.8	8.1	11.4	24.5	33.1	10.9	13.0	9.6
1001-1500	3.4	6.2	6.8	7.2	11.6	23.2	12.1	6.1
1501-2500	2.6	4.2	3.0	4.1	11.8	5.2	14.0	11.1
2501-5000	2.4	4.5	7.1	6.2	2.8	8.4	26.7	3.1
5000+	3.7	11.1	7.8	9.5	3.0	12.2	8.7	54.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Both acquiring and acquired frims are defined on a consolidated enterprise basis. All measurements are as of 1979.

Source: Statistics Canada: Special Tabulations.

TABLE 7

Distribution of Acquiring Firm Size Class for Each Size Class of Acquired Firms (By Employment-Wage and Salary Earners) in the Manufacturing Sector During the 1970s

(%)

Employment Size Class of of Acquired Firm	Employment Size Class of Acquiring Firm								
	0-100 (I)	101-200 (II)	201-500 (III)	501-1000 (IV)	1001-1500 (V)	1501-2500 (VI)	2501-5000 (VII)	5000+ (VIII)	By All Classes (IX)
0-100	27.4	14.9	17.4	11.8	6.4	6.3	6.6	9.4	100.0
101-200	5.1	13.5	17.9	21.7	6.8	10.0	10.3	14.6	100.0
201-500	1.0	4.8	20.8	18.8	10.6	13.8	15.7	14.5	100.0
501-1000	2.6	3.3	8.9	22.8	18.9	7.4	15.4	20.6	100.0
1001-1500	1.8	3.8	8.0	10.2	10.1	24.2	21.9	20.0	100.0
1501-2500	1.5	2.8	3.9	6.4	11.4	5.9	27.6	40.4	100.0
2501-5000	1.3	3.1	9.2	9.8	2.7	9.6	52.9	11.3	100.0
5000+	1.0	2.9	3.8	5.6	1.1	5.3	6.5	74.0	100.0

Note: Both acquiring and acquired firms are defined on a consolidated enterprise basis. All measurements are as of 1979.

Source: Statistics Canada: Special Tabulations.

TABLE 8

A Comparison of Percentage of Total Employment of all Mergers Accounted for By Acquired Firms and By Acquiring Firms by Employment Size Class in the Manufacturing Sector in the 1970s

(%)

Percentage of Total Employment of All Mergers Accounted For By	Employment Size Class								
	0-100 (I)	101-200 (II)	201-500 (III)	501-1000 (IV)	1001-1500 (V)	1501-2500 (VI)	2501-5000 (VII)	5000+ (VIII)	Total
A) Acquired Firms in the Size Class	12.0	9.2	15.9	14.2	9.3	8.4	8.4	22.4	100.0
B) Acquiring Firms in the Size Class	4.9	5.8	11.0	13.2	8.1	9.7	16.7	30.6	100.0

Note: Firms are defined on a consolidated basis. Employment size class refers to size as of 1979.

Source: Statistics Canada: Special Tabulations.

TABLE 9

The Importance of Multiple Acquisitions Per Consolidated Acquiring Enterprise in the Manufacturing Sector During the 1970s

No. of Acquisitions by Acquiring Firms	Acquisition Category: The Consolidated Enterprise		The Unconsolidated Enterprise		The Establishment	
	No. of Acquiring Firms	% of Total Employment in Acquired Entity	No. of Acquiring Firms	% of Total Employment in Acquired Entity	No. of Acquiring Firms	% of Total Employment in Acquired Entity
I	II	III	IV	V	VI	VII
0					2	0.00
1	907	31.12	870	25.37	798	19.18
2	166	17.33	172	13.29	173	10.54
3	69	15.02	73	10.21	90	8.37
4	26	14.64	30	5.79	46	8.60
5	11	4.62	15	3.53	21	3.27
6	13	4.09	16	7.20	14	3.03
7	5	1.34	14	7.25	16	2.82
8	6	2.87	5	3.00	8	2.46
9	6	2.07	8	2.70	7	2.51
10	1	n.a.	4	7.69	5	2.31
11-15	7	4.21	6	4.01	24	11.76
15+	1	n.a.	5	9.94	14	25.13
	1218	100.00	1218	100.00	1218	100.00

Note: 1) For the establishment category, there are 2 acquisitions involving head offices only accounting for some 19 employees. This is entered in the zero row.

2) For 2 categories of acquisitions of consolidated enterprises (10, and 15+), confidentiality rules preclude publication of employment percentages. Together they account for less than 3.5 percentage points of employment in acquired entities.

3) Employment size is based on 1979 data.

Source: Statistics Canada: Special Tabulations.

TABLE 10

Average Number of Firms and Establishments

Across 141[1] Canadian Manufacturing Industries for

Various Categories of Entry and Exit: 1970 and 1979

Firm Category	Number of Firms		Number of Establishments	
	1970	1979	1970	1979
All Firms	88.1	74.6	105.3	93.3
All Entrants[2]	--	24.6	--	28.2
1) Entry by birth	--	21.7	--	22.7
2) Entry by Acquisition	--	4.9	--	7.3
All Exits[3]	38.3	--	42.3	--
1) Exit by Divestiture	7.2	--	9.4	--
2) Exit by Scrapping	33.2	--	34.4	--
All Continuing Firms[4]	50.3	50.3	63.5	65.4
1) with Continuing Establishments	49.8	49.8	58.3	58.3
2) with Divestiture	1.6	--	2.5	--
3) with Acquisition	--	3.1	--	5.5
4) with Births	--	3.9	--	5.7
5) with Scrapping	3.7	--	6.2	--

Notes: 1) The sample corresponds to the 167 four digit s.i.c. industries for which data existed in both 1970 and 1979 less those industries classified as miscellaneous or 141 industries in total.

2) The number of firms that entered between 1970 and 1979 by births and/or acquisitions.

3) The number of firms that exited between 1970 and 1979 by divestiture and/or scrapping.

4) The number of firms that existed in both 1970 and 1979.

Source: Statistics Canada: Special Tabulations.

TABLE 11

Average[1] Share of Number of Enterprises and of Shipments Across 141 Canadian Manufacturing Industries for Various Categories of Entry and Exit: 1970 and 1979

Firm Category	Share of Number of Firms 1970	Share of Number of Firms 1979	Share of Shipments 1970	Share of Shipments 1979
All Firms	100.0	100.0	100.0	100.0
All Entrants	---	32.5(33.0)	---	26.2(26.6)
1) Entry by Birth	---	27.4(29.0)	---	14.0(14.8)
2) Entry by Acquisition	---	5.9(6.7)	---	12.3(13.8)
All Exits	42.9(43.5)	---	30.7(31.1)	---
1) Exit by Divestiture	7.5(8.2)	---	14.5(15.8)	---
2) Exit by Scrapping	36.3(37.6)	---	16.2(16.8)	---
All Continuing Firms	57.1	67.4	69.3	73.8
1) with Continuing Establishments	56.5	66.8	63.6	65.7
2) with Divestiture	0.6(1.9)	---	1.1(3.5)	---
3) with Acquisition	---	2.1(4.1)	---	3.2(6.3)
4) with Births	---	3.9(5.2)	---	4.9(6.5)
5) with Scrapping	3.1(4.3)	---	4.5(6.2)	---

Notes: 1) The average is calculated both across the entire 141 industry sample (the first number) and then for those industries where non-zero observations occur (the bracket figure). Where there is only one figure, the averages are the same.

2) For other notes see Table 10.

Source: Statistics Canada: Special Tabulations.

TABLE 12

Means of Acquired Relative Plant Characteristics as of 1979 of Horizontal and Diversified Mergers in the Manufacturing Sector in the 1970s

	DIVERSIFIED[2] / HORIZONTAL ENMERG / CONMERG I	DIVERSIFIED[2] / CONTINUING ENMERG / CON II	HORIZONTAL[2] / CONTINUING CONMERG / CON III
Size[4] (Arithmetic Mean)	2.31(.80)[3,b]	1.61(.29)[3,b]	1.28(.12)[3,b]
(Logarithmic Mean)	1.40(.13)[a]	1.42(.13)[a]	1.30(.12)[a]
Productivity[5]	1.08(.07)	1.02(.04)	1.02(.04)
Profitability[6]	1.16(.12)[9]	1.17(.07)[a]	1.06(.06)
Diversity[7]	1.11(.07)	1.02(.03)	1.004(.03)
Length of Production Run[8]	1.65(.30)[b]	1.32(.14)[b]	1.250(.11)[b]
Average Wage	1.03(.02)	.95(.01)[a]	.96(.02)[b]

Notes:
1) The ratios are calculated only for those industries in which there are non-zero observations in both categories.
2) For a definition of each column, see text.
3) Standard Error of the mean is in brackets
   a) significantly different from 1 at .01 level for one-tailed t test
   b) significantly different from 1 at .05 level for one-tailed t test
4) Size is sales per establishment.
5) Productivity is value added per wage and salary earner.
6) Profitability is value-added minus wages and salaries divided by value of sales.
7) Diversity is the herfindahl of the sales shares of each product produced where products are defined at the 4 digit ICC level.
8) Average length of production run is the average size of establishment divided by the herfindahl equivalent number of products derived from the diversity index.
9) Because of several unreliable outliers the uncorrected mean was negative. The reported average excludes 2 top and 2 bottom observations. Other exclusions on the tail of the distribution leave the ratio greater than one but not significantly so.

Source: Statistics Canada: Special Tabulations.

TABLE 13

Means of Relative Divested Plant Characteristics as of 1970 of Horizontal and Diversified Mergers During the 1970s in the Manufacturing Sector

	DIVESTED EXITS[1] / DIVESTED BY CONTINUING FIRMS ($\frac{EXSELL}{CONSELL}$) I	DIVESTED EXITS[1] / CONTINUING ($\frac{EXSELL}{CON}$) II	DIVESTED BY CONTINUING FIRMS[1] / CONTINUING ($\frac{CONSELL}{CON}$) III
Size[3] (Arithmetic Mean)	1.31(.20)[2]	1.66(.20)[2,a]	1.69(.20)[2,a]
(Logarithmic Mean)	1.24(.14)	1.57(.16)[a]	1.73(.21)[a]
Productivity[3]	1.19(.13)	.98(.03)	1.05(.07)
Profitability[3]	1.09(.10)[4]	1.07(.08)	.99(.09)
Diversity[3]	.98(.05)	.99(.03)	1.03(.06)
Length of Production Run[3]	1.21(.16)	1.59(.23)[a]	1.67(.21)[a]
Average Wage[3]	.99(.52)	.96(.01)[a]	.99(.02)

Notes: 1) For definitions of each column, see text.

2) Standard Error of the mean is in brackets.
   a) significantly different from 1 at .01 level for one-tailed t test.
   b) significantly different from 1 at .05 level for one-tailed t test.

3) For definitions of characteristics, see Table 12.

4) See note 9, Table 12.

5) The ratios are calculated only for those industries in which there are non-zero observations in both categories.

Source: Statistics Canada: Special Tabulations.

TABLE 14

A Comparison of the Entry Process

Domestic Firms

	By Plant Creation	By Acquisition
Constant	2.91 (0.44)	0.72 (0.30)
Growth Variables		
GX	-0.40 (0.01)	0.077 (0.00)
GM	0.11 (0.57)	-0.081 (0.01)
GT	1.00 (0.00)	0.002 (0.89)
EXCESS	0.72 (0.00)	-0.005 (0.66)
Profitability		
PCOMB	0.48 (0.93)	2.49 (0.01)
Barriers to Entry		
ES	-29.60 (0.28)	-3.72 (0.46)
RCR	-8.10 (0.22)	1.14 (0.36)
CDR	1.17 (0.69)	0.62 (0.25)
AD	-20.26 (0.66)	-2.79 (0.74)
Other		
REG	7.03 (0.19)	-- --
Firms		
NC	0.17 (0.00)	0.010 (0.00)
NF	0.33 (0.00)	0.075 (0.00)
NTD1	-0.04 (0.01)	0.001 (0.65)
NTD2	-0.20 (0.00)	-0.006 (0.11)
$\bar{R}^2$	0.87	0.57
F	64.47 (0.00)	15.54 (0.00)
degrees of freedom	(14,126)	(13,127)

Note: The figures in brackets present the probability that $|t| > 0$.

Source: Statistics Canada: Special Tabulations

TABLE 15

A Comparison of the Entry Process

Foreign Firms

	By Plant Creation	By Acquisition
Constant	-0.59 (0.32)	-1.19 (0.05)
Growth Variables		
GX	0.018 (0.44)	-0.033 (0.13)
GM	0.027 (0.35)	0.031 (0.29)
GT	0.018 (0.22)	0.008 (0.57)
EXCESS	0.025 (0.03)	0.002 (0.85)
Profitability		
PCOMB	40.34 (0.69)	-0.42 (0.60)
Barriers to Entry		
ES	4.59 (0.29)	10.82 (0.01)
RCR	1.32 (0.22)	2.46 (0.02)
CDR	-0.22 (0.64)	-0.95 (0.03)
AD	-16.98 (0.02)	0.21 (0.97)
Other		
M	0.67 (0.43)	0.77 (0.34)
VAR	-- --	-0.02 (0.26)
Firms		
NC	0.004 (0.09)	0.005 (0.02)
NF	0.166 (0.00)	0.149 (0.00)
NTD1	-0.004 (0.10)	-0.003 (0.16)
NTD2	-0.005 (0.11)	-0.004 (0.22)
$\bar{R}^2$	0.67	0.65
F	21.61 (0.00)	18.94 (0.00)
Degrees of Freedom	(14,126)	(15,125)

Note: The figures in brackets present the probability that $|t| > 0$.

Source: Statistics Canada: Special Tabulations.

TABLE 16

A Comparison of the Expansion Process of Continuing Firms

Domestic Firms

	By Plant Creation	By Acquisition
Constant	-0.44 (0.45)	0.014 (0.97)
Growth Variables		
GX	0.050 (0.02)	0.088 (0.00)
GM	-0.013 (0.63)	-0.075 (0.00)
GT	0.031 (0.04)	-0.019 (0.04)
EXCESS	0.022 (0.04)	-0.022 (0.00)
Profitability		
PCOMB	11.58 (0.06)	11.68 (0.00)
Barriers to Entry		
ES	1.04 (0.81)	-1.05 (0.70)
RCR	1.46 (0.17)	0.81 (0.22)
CDR	0.20 (0.66)	0.07 (0.83)
Other		
REG	-- --	0.57 (0.01)
Firms		
NC	0.018 (0.00)	0.005 (0.00)
NF	0.040 (0.00)	0.026 (0.00)
NTD1	-0.542 (0.79)	0.008 (0.00)
NTD2	-0.018 (0.00)	-0.002 (0.44)
$\bar{R}^2$	.74	.78
F	34.43	40.40 (0.00)
degrees of Freedom	(12,128)	(13,127)

Note: a) Times 10^{-3}.

b) The figures in brackets present the probability that $|t| > 0$.

Source: Statistics Canada: Special Tabulations.

TABLE 17

A Comparison of the Expansion Process of Continuing Firms

Foreign Firms

	By Plant Creation	By Acquisition
Constant	-0.64 (0.18)	0.17 (0.54)
Growth Variables		
GX	0.033 (0.06)	0.022 (0.03)
GM	-0.025 (0.29)	-0.009 (0.46)
GT	0.014 (0.22)	-0.002 (0.76)
EXCESS	0.006 (0.48)	-0.002 (0.72)
Profitability		
PCOMB	1.01 (0.12)	0.91 (0.12)
Barriers to Entry		
ES	2.08 (0.53)	-0.71 (0.72)
RCR	1.49 (0.07)	0.39 (0.42)
CDR	-0.03 (0.94)	-0.31 (0.14)
Other		
M	1.41 (0.03)	-- --
VAR	-0.012 (0.32)	-- --
Firms		
NC	0.001 (0.53)	.0006 (0.57)
NF	0.074 (0.00)	.035 (0.00)
NTD1	0.092[a] (0.95)	-.002 (0.06)
NTD2	-0.001 (0.59)	-.0008 (0.62)
R^2	.47	.46
F	10.21 (0.00)	11.00 (0.00)
Degrees of Freedom	(14,126)	(12,128)

Note: a) Times 10^{-3}.

b) The figures in brackets present the probability that $|t| > 0$.

Source: Statistics Canada: Special Tabulations.

Footnotes

1. Section 33 of the Combines Investigation Act makes a merger or monopoly illegal. Section 2 defines a merger as an "acquisition... whereby competition ... is or is likely to be lessened to the detriment ... of the public". A statute governing mergers was first passed in 1910 (S.C. 1910, C. 9), although the term merger was not defined until 1935, with the present definition dating from 1960. Until 1976, merger legislation in Canada was largely confined to the manufacturing sector, the focus of the empirical results reported here.

2. For the period 1945-61, the data were taken from the detailed survey in Reuber and Roseman (1969). For the post 1961 period, they originate from the merger record of the Bureau of Competiton Policy, Department of Consumer and Corporate Affairs.

3. For this table,each acquisition of an unconsolidated enterprise was counted as one merger. The number of such acquisitions that were horizontal was calculated separately as those between firms in the same 4-digit category, those in the same 3-digit category but not the same 4-digit category, and those in the same 2-digit but not the same 3-digit category. We report the sum of these (all 2-digit mergers) in in Table 1. All remaining mergers by default were defined as being vertical or conglomerate. In each case the acquiring firm was defined as being in a particular industry if it possessed an unconsolidated enterprise located therein.

4. Alternate measures based on sales or employment rather than numbers of firms yield broadly similar results.

5. The second major provision of the Act came into effect on October 15, 1975. This regulated the establishment of new Canadian businesses by non-Canadians who either did not already have any business in Canada, or did not have any business in Canada to which the new business is or would be related. Hence merger figures for 1974-76 are potentially affected by the possibility that in advance of the legislation foreign firms created new businesses and thus did not acquire existing businesses in the first three year period.

6. This classification does not necessarily mean a new plant was newly constructed or an exiting plant was scrapped. In both cases, the plant could have been redeployed to or from another industry.

7. For the purposes of this section, a firm refers to commonly controlled establishments within an industry and therefore refers to the "unconsolidated" enterprise rather than the consolidated enterprise which covers all plants no matter which 4-digit industry the plants may be included in.

8. The categories chosen for the different methods of entry and exit are not mutually exclusive. A firm can enter an industry by building plant or by acquiring it or by doing both. Table 10 indicates that the overlaps are relatively minor in the firm entry and exit categories since the total number of firms entering (exiting) by one or other method is almost the same as the total number of entrants (exits) on average. The overlap of continuing firms that divested, acquired, created or scrapped plant is slightly greater though still small in percentage terms. We omit firms which entered and exited between 1971 and 1978.

9. The averages are calculated over the entire sample and over those industries for which there were non-zero observations. See Baldwin and Gorecki (1983a, Table 2, p. 13) for further information on the percentage of industries for which there were non-zero observations for the various entry and exit categories.

10. For entry studies, see Mansfield (1962), McGuckin (1972), Orr (1974a, 1974b), Deutsch (1975), Harris (1976), Masson and Shaanan (1982), Baldwin and Gorecki (1983a), Gorecki (1975, 1976).

11. While the focus of this study is not on the entry equation per se, a few comments are in order (for more extensive discussion, see Baldwin and Gorecki, 1983a). Our contribution is two-fold. First, our data base is much more extensive so that aggregations previously made can be avoided. The work of Orr (1974a) was based on net number of firms -- which is unable to distinguish the entry from the exit process. Harris (1976) and Masson-Shannan (1983) use a data base from trade records rather than census records and probably contains the same biases as the Canadian merger record. Second, our conceptual framework is different from most previous studies that place greater emphasis on entry as a response to profitability. Mansfield (1962) catches all non-profit related entry in the intercept, thereby essentially ignoring explanations of the latter. Orr (1974a) assumes that, when profits are zero, entry is proportional to industry sales -- thereby ignoring the difference in average firm size across industries. Masson and Shannan (1982) set up their model so that only profits matter. In our study we place greater emphasis on the notion of entry as a replacement process than a response to disequilibrium profitability.

12. Using the ratio of entry to number of existing firms as the dependent variable as others have done equivalent to postulating that the replacement coefficient is a function of all of these variables. It does not appear to us to be sensible to presume the rate of entry depends on profitability; since the former can vary with the number of firms in an industry. A large number of new entrants in response to higher profitability translates into a low rate of entry when firm numbers are large.

13. The country of control concept is largely that developed and used under the Canadian Corporations and Labour Unions Returns Act -- in general a corporation is considered to be foreign controlled if 50% or more of its voting rights are known to be held outside Canada or are held by one or more Canadian corporations that are themselves foreign controlled.

14. For a discussion of the data base, see Baldwin and Gorecki (1983a, 1983b).

15. Alternate forms of profitability variables were tried -- average, large firm, or small firm profitability; and per cent of firms making negative profits (Stonebraker [1976]). The best was an interaction term combining overall profitability and the difference between small and large firm profitability.

16. Residual concentration (RCR) and plant scale (ES) were highly correlated. Removal of one invariably increased the significance of the other. We discuss this further in the section dealing with results.

17. A number of other variables were included but not reported. They are defined in the appendix. These include interaction terms on growth and the advertising or R&D variables (GTRD, GTAD), other definitions of profit ability (PB, PCON, PDIF), risk (CVAR, PNEG), profit growth (RG1, RG3, and RG6), comparative advantage (CA) and foreign ownership (FO).

18. This is essentially the route chosen by Orr (1974a), Gorecki (1975), and Khemani and Shapiro (1983).

19. Although "miscellaneous" industries were excluded from the analysis, it was recognized that some of the remaining industries might be omitted. Additional regressions were performed using different criterion for excluding outliers. The results reported in this paper were robust (for further discussion, see Baldwin and Gorecki [1983a]). We also performed a logit regression but found the results sufficiently similar to omit their presentation here.

20. Note that since GT = GD - GM + GX, the effect of import and export growth is the sum of the coefficients on GT and GX.

21. 'Large' plants are those which are required to report on "long forms". For a definition see Statistics Canada (1979).

22. The gross rate of return used in both PCON and PDIF was calculated using average margins/sales ratios weighted by value-added and multiplied by the industry sales/capital ratio.

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